



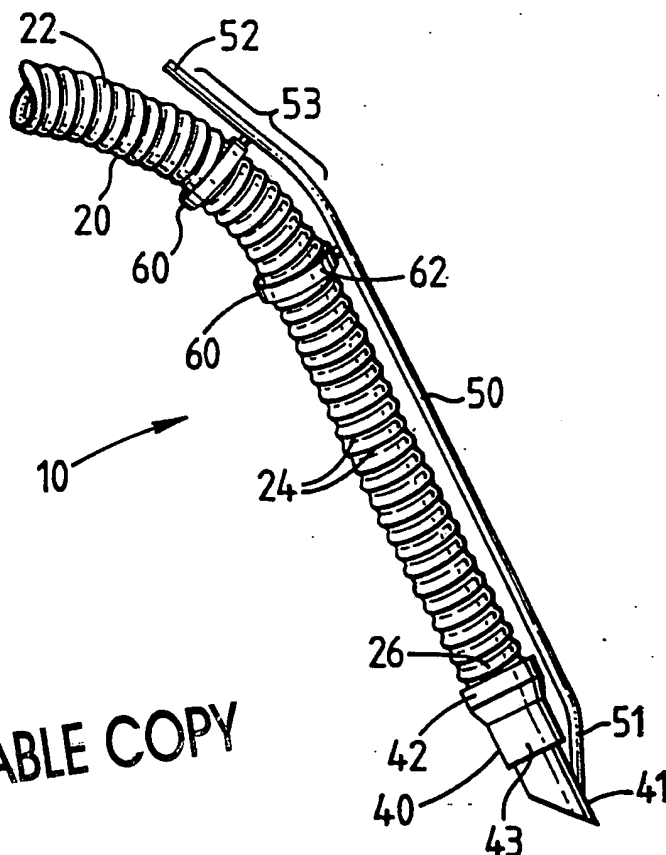
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(54) Title: HOSE ASSEMBLY

(57) Abstract

The present invention relates to hose apparatus for a vacuum cleaning machine which apparatus comprises a flexible conduit (20), and a substantially rigid elongate handle member (50) attached to said conduit at or towards the working end (26) thereof, wherein said conduit is adapted for connection at its other end (27) to vacuum cleaning machine for the provision of an air flow therethrough whereby in use said handle can be used to direct the working end of the conduit over a surface to be cleaned.



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HOSE ASSEMBLY

DESCRIPTION

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The present invention relates to a hose assembly. In particular, the present invention relates to a hose assembly for a vacuum cleaner.

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A typical domestic or industrial vacuum cleaner which is known in the prior art comprises a body portion which houses an electric motor and a dust container, a flexible hose, a tubular wand assembly and a nozzle.

15

One end of the hose is connected to the body portion at an inlet; the other end of the hose is connected to a first end of the tubular wand. The other end of the tubular wand is connected to the nozzle, and the arrangement is such that the hose, nozzle, and wand

20

define a continuous conduit. Operation of the motor causes air to enter into the conduit at the nozzle and to pass along the conduit towards the motor. Typically, the tubular wand is held by an operator towards its end

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remote from the nozzle and is used to direct the nozzle over a surface to be cleaned. Dirt and detritus at the surface is entrained in the flow of air into the nozzle and is collected in the dust container in the body
5 portion of the vacuum cleaner.

The tubular wand assembly comprises a plurality of tube portions which can be fitted together to form the wand. Each portion is made of metal, usually a light-weight
10 steel, and the assembled wand is long enough to allow the operator to direct the nozzle over a surface without having to stoop or stretch. The assembled wand, therefore, must be strong enough to allow the nozzle to be moved and directed over the surface by an operator
15 standing substantially erect and holding the end of the wand assembly remote from the nozzle.

The arrangement described above is generally satisfactory for domestic vacuum cleaners. Industrial
20 vacuum cleaners, however, are typically designed and constructed to cope with larger quantities of dust and other detritus; the hose and tubular wand of an industrial vacuum cleaner typically have dimensions several times larger than the corresponding dimensions

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of domestic vacuum cleaners. For example, it is generally desirable that the diameter of the tubular wand of an industrial vacuum cleaner should be about 2 to 3 times larger than the diameter of a domestic vacuum cleaner tubular wand. As mentioned above, the wand of a vacuum cleaner is typically made of metal to provide the required stiffness. In the case of an industrial vacuum cleaner, there is a particular requirement for all the components of the cleaner to be built to a strong and robust specification. As a consequence, however, it has been found that the tubular wand of a typical, known industrial vacuum cleaner is unwieldy having regard to its size and weight as compared with a domestic vacuum cleaner. There is, therefore, a need for a large bore hose assembly in which the operative end is less cumbersome than the steel tube arrangement currently employed.

In accordance with one aspect of the present invention, there is provided a hose assembly for a vacuum cleaner, which apparatus comprises:

- a flexible conduit, and
- a substantially rigid elongate handle member attached to said conduit at or towards the working end

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thereof,

wherein said conduit is adapted for connection at its other end to vacuum cleaning machine for the provision of an air flow therethrough whereby in use
5 said handle can be used to direct the working end of the conduit over a surface to be cleaned.

According to a further aspect of the present invention, there is provided vacuum cleaning apparatus
10 which comprises a hollow container,

motor means for creating an air flow through at least part of said container,

a flexible conduit, one end of which communicates with said container and the other end of which is adapted
15 for collection of dirt, detritus and the like,

characterised by the provision of handle means exteriorly of the said other end to permit guidance by an operator of said other end over a surface to be cleaned.

20 The conduit may be made from any suitable flexible, light-weight material. The conduit may be manufactured from a synthetic plastics material. Alternatively, the conduit may be formed from a woven material of natural or synthetic fibres which is impregnated with a

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synthetic plastic material to produce an air-tight conduit. The conduit may be corrugated to provide it with a degree of strength. Preferably, the corrugations should be circumferential or helical to the conduit to
5 allow the conduit to flex.

Said other or working end of the conduit may be adapted to carry or connect with a work piece such as a shaped nozzle or brush. Said end may comprise a connector
10 portion which may further include a cylindrical wall having a first end which is widened to receive the one end of the flexible conduit, and a second end which is shaped to allow it to mate with a corresponding connector portion on the nozzle.

15
In use, said one end of the flexible conduit, which is remote from the working end, is attached to an inlet on the vacuum cleaner body. The working end may be used in conjunction with a nozzle as described above or without
20 a nozzle attached. Suitable nozzles are well known in the art and include nozzles which have a relatively large, flat underside suitable for sweeping floors, carpets, etc.; nozzles which beat the surface as they sweep and nozzles which are shaped to facilitate

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vacuum-cleaning in areas of restricted access such as adjacent skirting boards, between furniture or household articles and between the cushions of armchairs and settees.

5

Preferably, the handle means may be elongate and is preferably long enough to allow an operator to use the handle to direct the working end of the conduit over or juxtaposed a surface to be cleaned without having to bend, stoop or stretch. The handle may be attached at the working end of the conduit. Alternatively, where the working end of the conduit is fitted to a connector portion, the handle may be attached to the connector. Where the conduit is used in conjunction with a nozzle piece, the handle may, alternatively, be attached to the nozzle.

10
15

The elongate handle may be formed as a single piece. Alternatively, the handle may be assembled from a plurality of handle portions. In a preferred embodiment of the present invention, the handle is long enough to permit an operator to hold said handle at an end remote from the working end of the conduit and to move and direct

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said working end over a surface whilst standing substantially erect.

5 The handle can be made of any suitable material which provides it with sufficient strength and rigidity to allow the operator to have sufficient control over the working end of the conduit without stooping.

10 The handle may be solid or hollow and may be formed of any suitable rigid material either metal or plastics material.

According to a preferred embodiment of the invention, the handle is formed from a single hollow steel tube.

15 The handle may be ergonomically shaped to provide convenient and comfortable operation thereat. The handle may be a substantially straight length of steel tube which is attached at a first end thereof to said working end of the conduit. The handle may be bent away from

20 its longitudinal axis at a second end remote from the first end thereby to provide a portion where the operator may conveniently hold the handle.

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The assembly may also include attachment means for maintaining the handle in juxtaposition with the flexible conduit. The attachment means may include one or more brackets or fittings which are attached to the handle remote from said first end. Each bracket or fitting may include a ring portion having a cylindrical external surface. The internal diameter of the ring portion may be larger than the external diameter of the flexible conduit such that the conduit can be passed through the ring portion, the arrangement being such that the conduit, towards the one end is held juxtaposed the elongate handle.

In a preferred embodiment, the assembly includes a plurality of such fittings which are spaced apart along the length of the elongate handle.

Following is a description by way of example and with reference to the accompanying drawings of methods of carrying the present invention into effect.

In the drawings:-

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Figure 1 is a perspective view from one side of a hose assembly of the present invention.

Figure 2 is an end view, partly in cross-section, of a
5 conduit bracket of the assembly of Figure 1.

With reference to Figure 1, a hose assembly 10 includes a flexible conduit 20 and an elongate handle 50.

10 Flexible conduit 20 is formed from a generally cylindrical flexible pipe which has a corrugated wall 22. Corrugations 24 are formed in wall 22 circumferential to the conduit 20 to permit the conduit 20 to flex and bend relative to its longitudinal axis.
15 Conduit 20 has a first end 26 and a second end 27 (not shown) which can be attached to a vacuum cleaner body portion (also not shown) which houses an electric motor and a dust container.

20 Conduit 20 is attached at its first end 26 to a connector portion 40 having first and second ends 41 and 42 respectively. Connector 40 includes a generally cylindrical wall 43 which is enlarged at its second end 42 to receive first end 26 of flexible conduit 20.

- 10 -

First end 26 of conduit 20 is attached inside second end 42 of connector 40 to form an air-tight seal.

5 The first end 41 of connector 40 is shaped to enable it to mate with a cooperating portion of a vacuum cleaner nozzle (not shown).

10 Elongate handle 50 comprises an elongate, substantially rigid hollow tube having first and second ends 51 and 52 respectively. Handle 50 towards its first end 51 is bent away from its longitudinal axis, and is welded at said first end 51 to the external surface of connector portion 40. Handle portion 50 towards its second end 52 is deflected away from its longitudinal axis to provide
15 a portion 53 where an operator or user may hold the handle 50.

20 Handle 50 carries two conduit brackets 60 which are disposed towards second end 52 of handle 50 and are spaced apart one from the other. Each conduit bracket includes a ring portion 61 which consists of a cylindrical wall having an external cylindrical surface 62 and two opposed annular edges 63. Each ring portion 60 has an internal diameter which is large than the

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external diameter of flexible conduit 20, and is
connected to handle 50 by a relatively short cylindrical
stem 70 which is welded at one end to handle 50 and at
its other end to the external surface 62 of ring portion
5 60. Each bracket 60 is attached to handle 50 such that
the axis of ring portion 61 is parallel to the axis of
handle 50.

With the first end 26 of conduit 20 attached to
10 connector portion 40, the second end 27 of conduit 20 is
passed through ring portion 61 of each bracket 60. The
conduit 20 is thus held juxtaposed handle 50. Second
end 27 can then be connected to said vacuum cleaner
body.

15 In use, the electric motor in the vacuum cleaner body
causes a flow of air to enter into conduit 20 at the
second end 42 of connector portion 40 (or through a
nozzle piece if attached to connector portion 40). The
20 operator holds handle 50 towards second end 52 and
directs second end 27 of conduit 20 (or the nozzle) over
a surface to be cleaned. Dirt and detritus entrained in
the flow of air enters into conduit 20 and is collected
in the dust container within the vacuum cleaner body.

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The hose assembly as herein described is particularly suitable for use with vacuum cleaners for use in an industrial environment wherein the tubular wand assemblies used hitherto have proved to be heavy and unwieldy. The present invention obviates the requirement for a tubular wand. A substantial portion of the conduit between the vacuum cleaner body and the cleaning end or nozzle thereof can be formed of a flexible, light-weight material. The rigid, elongate handle may be used to control the movement of the end of the conduit remote from the vacuum cleaner body. It will be appreciated that even where the handle is made of steel, it will be considerably lighter than the weight of a similar length of tubular wand. The present invention, therefore, provides a hose assembly suitable for use with an industrial-type vacuum cleaner which is lighter and more wieldy than the hose assemblies including a tubular wand hitherto employed.

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CLAIMS

1. Hose apparatus for a vacuum cleaning machine which
5 apparatus comprises
a flexible conduit, and
a substantially rigid elongate handle member
attached to said conduit at or towards the working end
thereof,
10 wherein said conduit is adapted for connection at
its other end to vacuum cleaning machine for the
provision of an air flow therethrough whereby in use
said handle can be used to direct the working end of the
conduit over a surface to be cleaned.
15
2. Vacuum cleaning apparatus comprising a hollow
container for the collection of dirt and detritus from a
surface to be cleaned;
motor means for creating an airflow through at least
20 said part of said container,
a flexible conduit an end of which communicates with
said container, the other working end of which is

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adapted for collection of dirt and detritus in use,
characterised by the provision of handle means
exteriorally of the other end to permit guidance by an
operator of said other end over a surface to be cleaned.

5

3. Apparatus as claimed in either preceding claim
wherein the conduit is formed from any flexible
lightweight material.

10

4. Apparatus as claimed in any preceding claim wherein
the conduit is manufactured from a synthetic plastics
material.

15

5. Apparatus as claimed in any one of claims 1 to 4
wherein the conduit is formed from a woven material of
natural synthetic fibres which is impregnated with a
synthetic plastics material to produce an airtight
conduit.

20

6. Apparatus as claimed in any preceding claim wherein
the conduit is corrugated.

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7. Apparatus as claimed in claim 6 wherein the corrugations are circumferential or helical to the longitudinal axis of the conduit to permit flexing of the latter.

5

8. Apparatus as claimed in any preceding claim wherein said working end of the conduit is attached to carry, or is connected with, a workpiece.

10

9. Apparatus as claimed in claim 8 wherein said working end of the conduit comprises a connector portion including a cylindrical wall having a first end which is adapted to receive the working end of the flexible conduit and a second end which is shaped to allow it to mate with a cooperating portion on a nozzle.

15

10. Apparatus as claimed in claim 8 or claim 9, wherein the handle means is elongate and of a length sufficient to allow an operative to use the handle to direct the working end of the conduit over or juxtaposed the surface to be cleaned.

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11. Apparatus as claimed in claim 10 characterised in that the handle is fixedly attached to the working end of the conduit.
- 5 12. Apparatus as claimed in claim 10 characterised in that the handle means is fixedly attached to a connector portion which itself is attached to the working end of the conduit.
- 10 13. Apparatus as claimed in any preceding claim wherein the handle is formed as a single piece.
14. Apparatus as claimed in any one of claims 1 to 12 characterised in that the handle is assembled from a
- 15 plurality of handle portions.
15. Apparatus as claimed in any preceding claim characterised in that the handle is formed of any suitable material which provides it with strength and
- 20 rigidity sufficient to allow the operator to have effective control over the working end of the conduit.

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16. Apparatus as claimed in claim 15 characterised in that the handle is solid or hollow and is formed of any suitable rigid metal or plastics material.

5 17. Apparatus as claimed in claim 16 wherein the handle is formed from a single hollow steel tube.

18. Apparatus as claimed in claim 17 wherein the handle comprised a substantially straight length of steel tube
10 attached at a first end thereof to said working end of the conduit.

19. Apparatus as claimed in any one of claims 14 to 18 characterised in that the handle is bent away from its
15 longitudinal axis towards a second end thereof to provide a convenient portion for use by an operator for controlling the working end thereof.

20. Apparatus as claimed in any preceding claim
20 characterised in that the handle includes one or more attachment means for maintaining the handle means juxtaposed said conduit.

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21. Apparatus as claimed in claim 20 wherein the said attachment means includes one or more brackets or fittings attached to the handle remote from the lower or working end thereof.

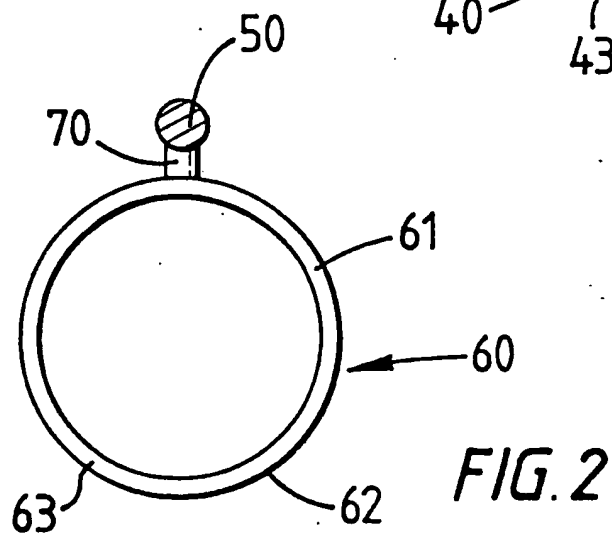
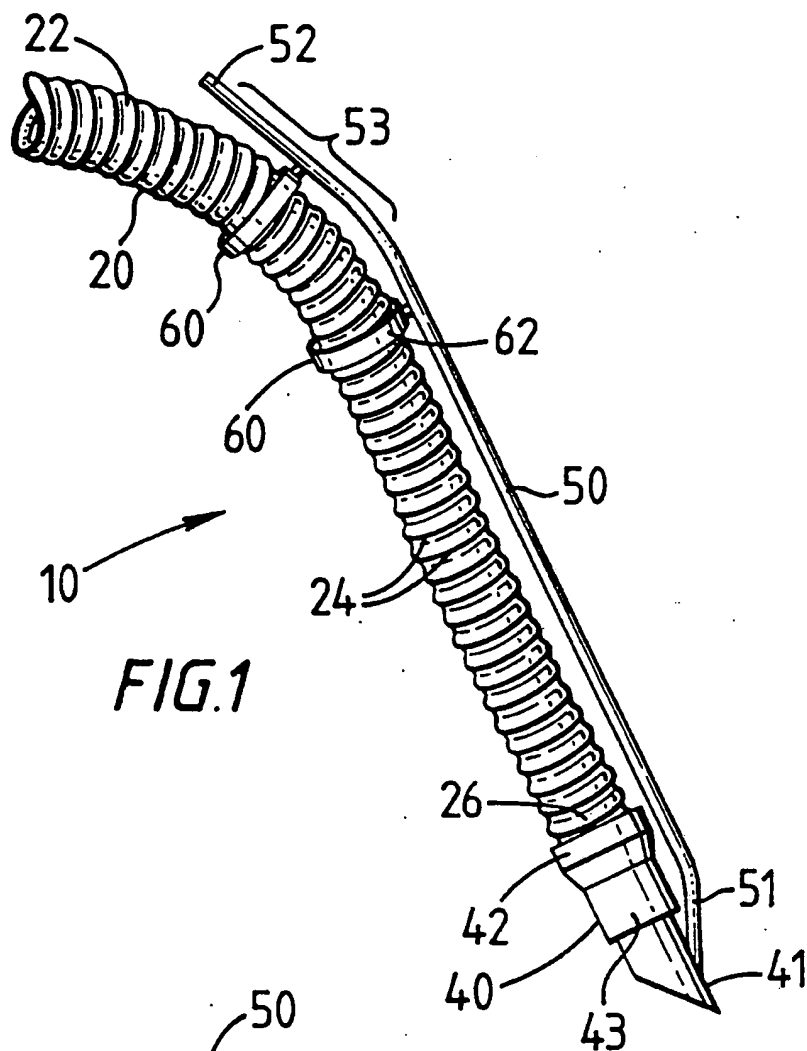
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22. Apparatus as claimed in claim 21 wherein each of the brackets or fittings comprises a ring portion having a cylindrical external surface.

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23. Apparatus as claimed in claim 22 wherein the internal diameter of the ring portion is larger than the external diameter of the flexible conduit such that the conduit is within the ring portion thereby to maintain the conduit in juxtaposition said handle portion.

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INTERNATIONAL SEARCH REPORT

PCT/GB 92/01953

International Application No

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁶		
According to International Patent Classification (IPC) or to both National Classification and IPC		
Int.Cl. 5 A47L9/24		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
Int.Cl. 5	A47L	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸		
III. DOCUMENTS CONSIDERED TO BE RELEVANT⁹		
Category ¹⁰	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
X	DE,U,8 808 909 (SIEMENS AG) 9 November 1989 see the whole document ---	1-13, 15-23
X	US,A,2 769 999 (R.E.SHEAHAN) 13 November 1956 see the whole document ---	1-13, 15-23
X	US,A,4 246 675 (D.V. COSTANZO) 27 January 1981 see the whole document ---	1-13, 15-23
A	NL,A,8 104 552 (P. PAPPENHEIM) 2 May 1983 see the whole document -----	1,2
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IV. CERTIFICATION		
Date of the Actual Completion of the International Search		Date of Mailing of this International Search Report
15 JANUARY 1993		02.02.93
International Searching Authority		Signature of Authorized Officer
EUROPEAN PATENT OFFICE		M. VANMOL

ANNEX TO THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO.

GB 9201953
SA 65807

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE-U-8808909	09-11-89	None	
US-A-2769999		GB-A- 750973	
US-A-4246675	27-01-81	None	
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